Space Weather Forecast

Issued on Friday, 16 September 2022 at 01:31 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of a Minor Geomagnetic Storm. Chance of Minor/Moderate Radio blackouts, but risk falling later in weekend.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low over the past 24 hours, mainly at low level Common class activity. The largest flare appears to have been associated with a filament eruption in the southwest quadrant. An associated Coronal Mass Ejection was emitted, which is likely to have an Earth directed component, with confirmation awaited from a model run.
Currently there are four sunspot regions on the Sun, with three of the regions large and elongated. Despite their size two of these elongated regions appear stable and relatively magnetically simple, whereas AR3098 approaching the northwest limb is relatively complex, and is therefore the most likely source for significant flares.

Solar Wind / Geomagnetic Activity: The solar wind as at slow ambient levels throughout, generally close to 330 km/s, after the previous day's CME arrival. The solar wind's magnetic field started at strong levels but quickly declined to become moderate. The north-south component of the magnetic field was positive throughout, and resulting geomagnetic activity was initially Active but quickly decreased to become Quiet.

Energetic Particles / Solar Radiation: While no solar radiation storms have been observed in the period, the high energy proton flux was initially slightly elevated, but then declined to reach background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain predominantly at Low levels, with a chance of M-Class flares, today and tomorrow. Thereafter solar activity is expected to decline, as AR3098 rotates off the Earth-facing disc. No notable regions are due over the limb to compensate.

Solar Wind / Geomagnetic Activity: After starting at background speeds the solar wind is expected to become enhanced later today or early tomorrow, due to the arrival of a fast wind from a coronal hole feature. This means the geomagnetic activity will be Quiet to Unsettled today, then increasing Unsettled to Active overnight with a chance of a Minor geomagnetic storm. From day 3 (18th) geomagnetic activity is excepted to decline to Quiet levels.

Energetic Particles / Solar Radiation: There is a Slight Chance of S1, mainly today and tomorrow, before the most active and complex region rotates off the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	40	30	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	15	5
Very Active	R3 to R5 X	No	5	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	5	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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